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The Resources Agency
DEPARTMENT OF WATER RESOURCES
Northern District

RECREATION USE SURVEY OF
INDIAN CREEK, PLUMAS COUNTY
1979

Technical Information Report No. 80-1

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This report was prepared to summarize information collected under WO 1600-4268 as part of an evaluation of a proposed reoperation of Antelope Reservoir, an element of the Department's Instream Water Use Program. Although this report was reviewed by appropriate individuals in the Department and other agencies, it is intended for internal use and should be considered preliminary and subject to revision.

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TABLE OF CONTENTS

| | <u>Page</u> |
|---|-------------|
| SUMMARY | 1 |
| INTRODUCTION | 2 |
| DESCRIPTION OF STUDY AREA | 3 |
| METHODS | 3 |
| Recreation Use Counts | 3 |
| Interviews | 5 |
| Creel Census | 5 |
| Water Samples | 5 |
| RESULTS | 6 |
| Recreation Use | 6 |
| Interview Data and Visitor Characteristics | 6 |
| Creel Census Data and Angler Success | 9 |
| Streamflow, Water Quality, and Weather Data | 11 |
| DISCUSSION | 13 |
| Limitations of Use Counts | 13 |
| Limitations of Interviews | 13 |
| Comparison of Use Counts and Interviews | 14 |
| Limitations of Creel Census | 15 |
| Comparison of 1978 and 1979 Survey Results | 16 |
| ACKNOWLEDGEMENTS | 17 |
| REFERENCES | 18 |

FIGURES

Figure Number

| | | |
|---|--|----|
| 1 | Indian Creek Recreation Survey and Creek Census, 1979 . . | 4 |
| 2 | Origin of Indian Creek Visitors by County Groups, 1979 . . | 10 |
| 3 | Indian Creek Angler Origin by County Groups, 1979 | 12 |

TABLE OF CONTENTS (Continued)

TABLES

| <u>Table Number</u> | | <u>Page</u> |
|-------------------------|---|-------------|
| 1 | Recreation Hours by Activity and Survey Area | 7 |
| 2 | Percent of People Participating in Each Recreation Activity, from Interview Data | 8 |
| 3 | Summary of Angler Success and Estimates of Fish Caught by Survey Area | 9 |
| 4 | Distribution of Interviews Compared to Distribution of Estimated Use | 14 |
| 5 | Comparison of Activity Composition from Interviews and Use Counts | 15 |
| 6 | Distribution of Anglers Censused Compared to Distribution of Angler Use | 16 |

APPENDICES

| <u>Appendix Number</u> | | |
|----------------------------|---|----|
| I | Description of Survey Reaches | 19 |
| II | 1979 Indian Creek Recreation Use Count Schedule | 22 |
| III | Recreation Use Survey - Use Count Form | 23 |
| IV | Recreation Use Survey - Interview Form | 24 |
| V | Visitor Characteristics - Indian Creek, 1979 | 25 |
| VI | Length Frequency of Censused Brown Trout, Indian Creek, 1979 | 27 |
| VII | Length Frequency of Censused Rainbow Trout, Indian Creek, 1979 | 28 |
| VIII | Streamflows in Indian Creek, 1979 | 29 |

SUMMARY

A field survey of streamside recreation along Indian Creek, Plumas County, was made in 1979. This was the second year of a three-year program to estimate the amount and types of recreation with augmented flow conditions. The random sample survey was taken at distinct stream reaches and during different use periods. Roving use counts were combined with interviews of recreationists to gather information on activity, length of stay, visitor origin, and other data. A concurrent creel census determined angler success.

There were an estimated 62,000 hours of recreation use (49,000 recreation days) on Indian Creek between April 28 and November 15, 1979. The most frequently observed activities were relaxing, camping, fishing, swimming and/or beach use. Forty-five percent of the fishing occurred on the first 18 km (11 miles) of stream below Antelope Dam. About 37 percent of the visitors lived in Plumas County, 55 percent said Indian Creek was their primary destination, and 39 percent stayed overnight in the area. Results from the use counts were similar to data obtained from 603 parties interviewed.

Anglers caught about 2,950 trout in 7,250 hours of fishing on the creek. Over 1,500 crayfish and 50 fish of other species were also taken. About 60 percent of the trout were caught in the first 18 km (11 miles) below Antelope Dam.

INTRODUCTION

The Northern District, Department of Water Resources, conducted a recreation survey and creel census on Indian Creek, Plumas County, from April 28 to November 15, 1979. This was the second year of a three-year study to determine the influence of augmented flow releases on streamside recreation.

Indian Creek below Antelope Dam offers an opportunity to implement the DWR water management policy, adopted in 1975, which states, "Instream uses for recreation, fish, wildlife, and related purposes shall be balanced with other uses." When Antelope Dam was first operated in 1964, streamflows in Indian Creek below the dam were stabilized. Minimum flows were increased from about $0.08 \text{ m}^3/\text{s}$ (3 cfs) to $0.28 \text{ m}^3/\text{s}$ (10 cfs) with a five-fold increase in trout populations (Gerstung, 1973). Presumably, fishing and related recreation on the creek were likewise enhanced. Increasing the flow to $0.57 \text{ m}^3/\text{s}$ (20 cfs) would result in an additional doubling of trout habitat (DWR, 1979).

On a trial basis, Antelope Reservoir was reoperated in March 1978 to increase flows in the creek in an effort to enhance recreation and fishery values without significant detriment to lake recreation. Streamflow releases were maintained at $0.57 \text{ m}^3/\text{s}$ (20 cfs) during 1978 and the effects on recreation were monitored (Cartier, 1979).

However, severe drought conditions in northeastern California during winter 1978-79 (runoff in Indian Creek was 35 percent of normal) caused the release to be reduced to $0.28 \text{ m}^3/\text{s}$ (10 cfs) in January 1979. This was done to assure filling of Antelope Reservoir and to avoid the possibility of an even lower release during summer 1979. The release from Antelope Dam was maintained at $0.28 \text{ m}^3/\text{s}$ (10 cfs) during the 1979 study period and the effects of this schedule on recreation were monitored.

DESCRIPTION OF STUDY AREA

Indian Creek is a major tributary of the East Branch of the North Fork Feather River in Plumas County. This scenic area was once occupied by Maidu Indians. It has a rich history of gold mining, ranching, and lumber production. In recent decades, recreation use has increased rapidly with water a major attraction. Employment today is divided among services, government, logging, and lumber manufacturing. Ranches operate in Indian and Genesee Valleys.

The 1979 study area included Indian Creek from its mouth upstream to Antelope Dam (Figure 1). The study area was divided into five stream sections: upper Indian Creek from the dam to Fournoy Bridge; Indian Creek in the Genesee Valley area from Fournoy Bridge to Taylorsville Park; Taylorsville Park and vicinity, including the campground, picnic area, and nearby creek; Indian Creek in Indian Valley between Taylorsville Park and Arlington Bridge; and lower Indian Creek, from Arlington Bridge downstream to the mouth (Appendix I).

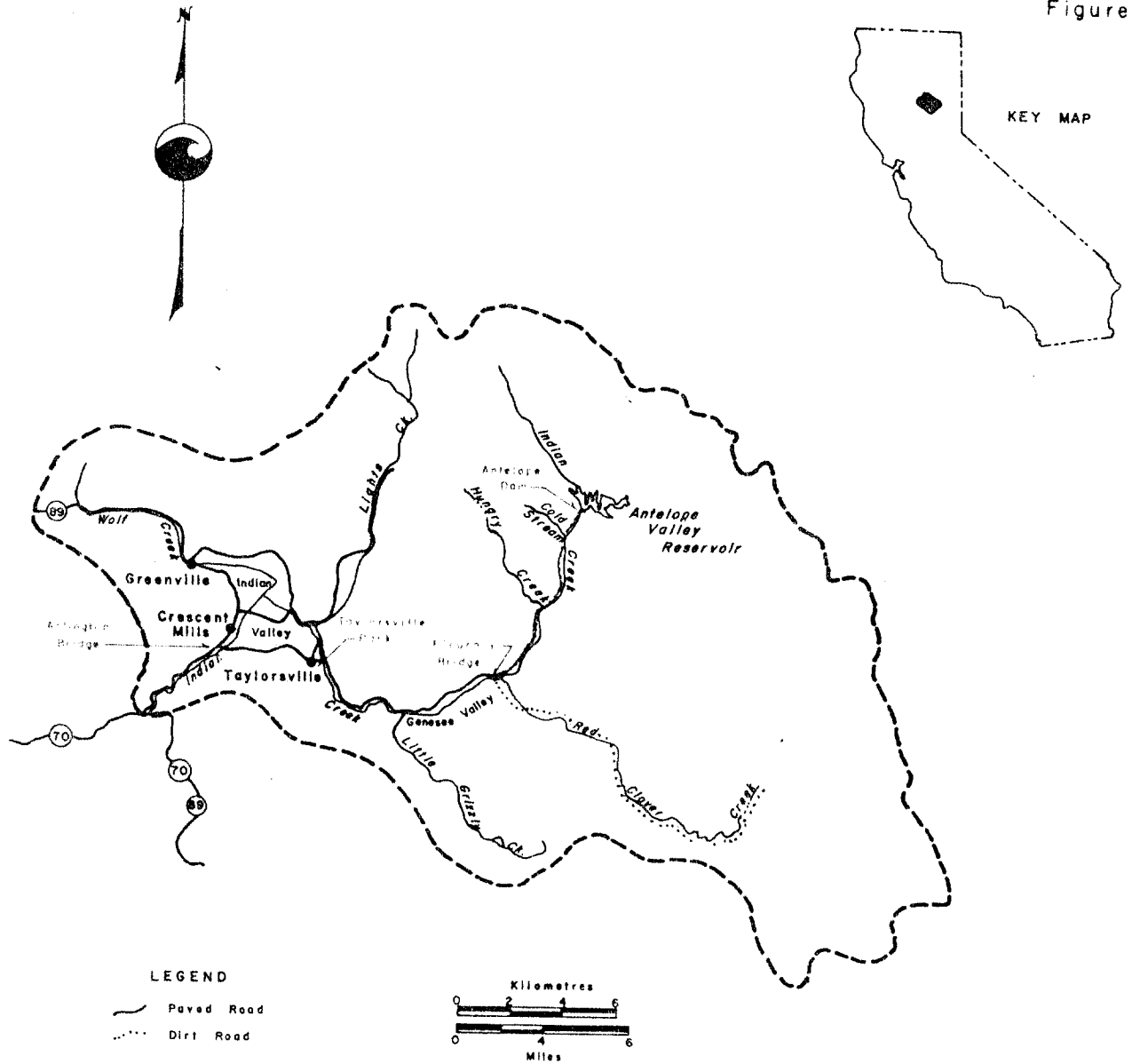
METHODS

Recreation Use Counts

Use counts were made on randomly selected dates within nine survey strata using the optimum allocation method described by Abrahamson and Tolladay (1959). Thirty-three days of the 202-day study period from April 28 through November 15, 1979, were surveyed; both days of the opening weekend of trout season, 5 of 10 holidays, 16 of 139 weekdays, and 10 of 53 weekend-days. Five one-hour counts of recreation use were made in the study area each day at regular periods, scheduled according to the number of daylight hours (Appendix II).

The surveys were made from a vehicle or on foot, as necessary, to check access and recreation sites. Recreationists (and their vehicles) were counted and recorded by recreation activity and stream section (Appendix III). The five daily counts were totalled and multiplied by factors that accounted for recreation use in the daylight periods not counted. Similarly, the resulting daily figures were expanded to estimate total recreation hours for all days in each stratum. Adding the stratum totals provided an estimate of

Figure 1



Indian Creek Recreation Survey and Creel Census 1979

recreation hours for the study period. To estimate total recreation days, total recreation hours were divided by the harmonic mean length of stay. The harmonic mean was used rather than the arithmetic mean to correct for the higher probability of interviewing people on lengthy visits (Lucas, 1963).

Interviews

Recreationists on Indian Creek were contacted during and between use counts. The interviewer attempted to cover a cross-section of activities as randomly as possible. Interview effort was distributed approximately in proportion to density of use. When use was low, most of the parties were interviewed, but during peak periods this was impossible. The information gathered from each party included location of residence, people per vehicle, recreation activities, overnight accommodations, and length of stay (Appendix IV).

Creel Census

Anglers along Indian Creek were contacted on the 33 recreation survey days and on 22 additional days to determine fishing success. Each angler was asked for county of residence and length of time spent fishing so far that day. Fish censused were counted, measured (fork length to nearest 0.5 cm [$\overline{0.2}$ inch]), and identified to species. Crayfish were counted but not measured. The roving census clerks attempted to contact as many fishermen as possible on each day, with extra effort on upper Indian Creek. Due to reduced use, one surveyor conducted the creel census as well as use counts and interviews after mid-July.

To determine total catch, the catch per hour was multiplied by estimated hours of fishing. Total weight of trout caught was calculated from estimated catch and length-weight data from Indian Creek (Brown and Haines, 1979).

Water Samples

Water samples were taken on 21 days at several locations on Indian Creek and later tested for pH, turbidity, and electrical conductivity. Water and air temperatures were also recorded.

RESULTS

Recreation Use

Total recreation use on Indian Creek was estimated at 62,000 recreation hours (⁺16,000 hours) for the period April 28 to November 15, 1979. Total recreation hours divided by harmonic mean length of stay indicates about 49,000 recreation days of use in 1979. A recreation hour is one hour of participation in any recreation activity by one person; a recreation day is participation by one person for all or part of a day.

Overall, relaxing was the major activity, followed by camping, fishing, and swimming and/or beach use. Taylorsville Park, upper Indian Creek, and lower Indian Creek accounted for 90 percent of the total use (Table 1).

Interview Data and Visitor Characteristics

People from 603 parties were interviewed in 1979, representing 1,899 persons and 628 vehicles. The mean number of people per party was 3.1, and the mean number of people per vehicle was 2.8. Almost 40 percent of the parties had 2 people. The mean length of day-use visits was 2.5 hours, with 20 percent of day visitors staying an hour or less. Overnight stays averaged 3.9 days; about 65 percent of overnight stays were either 2 or 3 days (1 or 2 nights) (Appendix V).

The most popular recreation activity was relaxing (47 percent of visitors), followed by fishing (43 percent), swimming and wading (24 percent), and beach use (15 percent), which is usually related to swimming but was a separate category in our interviews (Table 2). The percentages add up to more than 100 because many of the visitors participated in more than one activity.

Of the visitors interviewed, 61 percent were at Indian Creek for day use only, 13 percent stayed overnight somewhere in the general area and visited Indian Creek for day use, and 26 percent camped overnight along the creek. Of the day visitors, 45 percent came to the creek as a primary destination, 37 percent were stopping on the way to someplace else, and 18 percent were staying in the general area. Of those staying overnight in the study area, 85 percent said it was their destination and 15 percent said they were stopping en route elsewhere.

TABLE 1

RECREATION HOURS BY ACTIVITY AND SURVEY AREA

| Activity | Upper Indian Creek | Genesee Valley | Taylorsville Park | Indian Valley | Lower Indian Creek | Total Recreation Hours | Percent of Total |
|-----------------------------------|--------------------------|-------------------|----------------------|------------------|--------------------------|------------------------------|------------------------|
| Relaxing | 5,150 | 1,100 | 7,900 | 100 | 2,750 | 17,000 | 27 |
| Camping | 7,700 | 1,350 | 6,200 | 100 | 1,250 | 16,600 | 27 |
| Swimming and Beach Use | 150 | 1,000 | 2,050 | - | 5,300 | 8,500 | 14 |
| Fishing ^{1/} | 3,400 | 650 | 300 | 300 | 2,850 | 7,500 | 12 |
| Picnicking | 500 | 100 | 2,000 | - | 200 | 2,800 | 4 |
| Riding | - | 400 | 1,050 | 200 | 100 | 1,750 | 3 |
| Sightseeing | 300 | 200 | 100 | - | 800 | 1,400 | 2 |
| Walking for Pleasure | 200 | 150 | 600 | - | 200 | 1,150 | 2 |
| Gold Seeking | 200 | - | - | - | 800 | 1,000 | 2 |
| Miscellaneous/Other ^{2/} | 400 | 350 | 2,400 | - | 1,150 | 4,300 | 7 |
| Total Recreation Hours | 18,000 | 5,300 | 22,600 | 700 | 15,400 | 62,000 | 100 |

^{1/} Includes fishing for crayfish.^{2/} Includes shooting, rafting, berry-picking, playing, and miscellaneous activities. Rodeo attendance at Taylorsville is not included in these figures.

TABLE 2

PERCENT OF PEOPLE PARTICIPATING
IN EACH RECREATION ACTIVITY,
FROM INTERVIEW DATA

| <u>Activity</u> | <u>Percent of People Participating</u> |
|--|--|
| Relaxing | 47 |
| Fishing and bait gathering ^{1/} | 43 |
| Camping | 28 |
| Swimming and wading | 24 |
| Beach use | 15 |
| Sightseeing | 13 |
| Picnicking | 11 |
| Walking for pleasure | 7 |
| Gold seeking | 4 |
| Rock hunting | 4 |
| Bicycling | 3 |
| Horseback riding | 3 |
| Boating | 1 |
| Motorcycling | 1 |
| Other/miscellaneous ^{2/} | <u>8</u> |
| Totals ^{3/} | 212 |

^{1/} Includes fishing for crayfish and bait gathering.

^{2/} Includes attending rodeo, square dancing, outdoor games, berry picking, hunting or shooting, photography, bird watching, nature study, and hang gliding.

^{3/} Total number of people in the 603 parties interviewed was 1,899. The percentages add up to more than 100 because many people participated in more than one activity.

About 52 percent of the overnight visitors camped in undeveloped areas along the creek. Almost 31 percent camped at public campgrounds or parks. Ten percent stayed with friends or relatives in the area and the remainder stayed at motels, resorts, summer homes, or private campgrounds in the general area (Appendix V).

Modes of camping accommodations, in order of frequency, were: travel trailers (26 percent of overnight parties); pickup camper (22 percent); tent (15 percent); sleeping out or in car (14 percent), motor home, van or bus (13 percent); and tent trailer (3 percent of parties).

About 37 percent of the recreationists interviewed came from Plumas County. The next highest counties of origin were Butte (11 percent) and Lassen (7 percent). The combined counties of the San Francisco Bay area accounted for 14 percent. About 10 percent of the people interviewed were from out of state, mostly the Reno-Tahoe area of Nevada (Figure 2).

Creel Census Data and Angler Success

During the 1979 trout season, 1,111 anglers were contacted. They had fished about 1,491 hours, with a recorded catch of 334 brown trout (Salmo trutta), 240 rainbow trout (Salmo gairdneri), and 11 other fish. Total angling use was estimated at 7,250 hours (+1,400 hours) with an estimated catch of 2,950 trout and 50 other fish (Table 3).

TABLE 3

SUMMARY OF ANGLER SUCCESS AND ESTIMATES OF FISH CAUGHT BY SURVEY AREA

| <u>Survey Area</u> | <u>Estimated Recreation Hours Fishing</u> | <u>Rainbow Trout</u> | | <u>Brown Trout</u> | | <u>Other Fish^{1/}</u> | | <u>All Fish</u> | |
|--------------------|---|----------------------|---------------------|--------------------|---------------------|--------------------------------|---------------------|-----------------|---------------------|
| | | <u>Catch</u> | <u>Per Hour</u> | <u>Catch</u> | <u>Per Hour</u> | <u>Catch</u> | <u>Per Hour</u> | <u>Catch</u> | <u>Per Hour</u> |
| Upper Indian Creek | 3,400 | 0.12 | 410 | 0.39 | 1,330 | 0.002 | 10 | 0.51 | 1,750 |
| Genesee Valley | 650 | 0.30 | 200 | 0 | 0 | 0 | 0 | 0.30 | 200 |
| Taylorville Park | 300 | 0.33 | 100 | 0 | 0 | 0.02 | 5 | 0.35 | 105 |
| Indian Valley | 300 | 0.10 | 30 | 0.01 | 5 | 0.03 | 10 | 0.15 | 45 |
| Lower Indian Creek | <u>2,600</u> | <u>0.32</u> | <u>835</u> | <u>0.01</u> | <u>40</u> | <u>0.01</u> | <u>25</u> | <u>0.35</u> | <u>900</u> |
| | 7,250 | 0.22 | 1,575 | 0.19 | 1,375 | 0.01 | 50 | 0.41 | 3,000 |

^{1/} Includes Sacramento squawfish (Ptychocheilus grandis), brown bullhead (Ictalurus nebulosus), hardhead (Mylopharodon conocephalus), green sunfish (Lepomis cyanellus), and bluegill (Lepomis macrochirus). In addition, over 1,500 crayfish (Pacifastacus leniusculus) were caught from lower Indian Creek in 250 hours of fishing for crayfish.

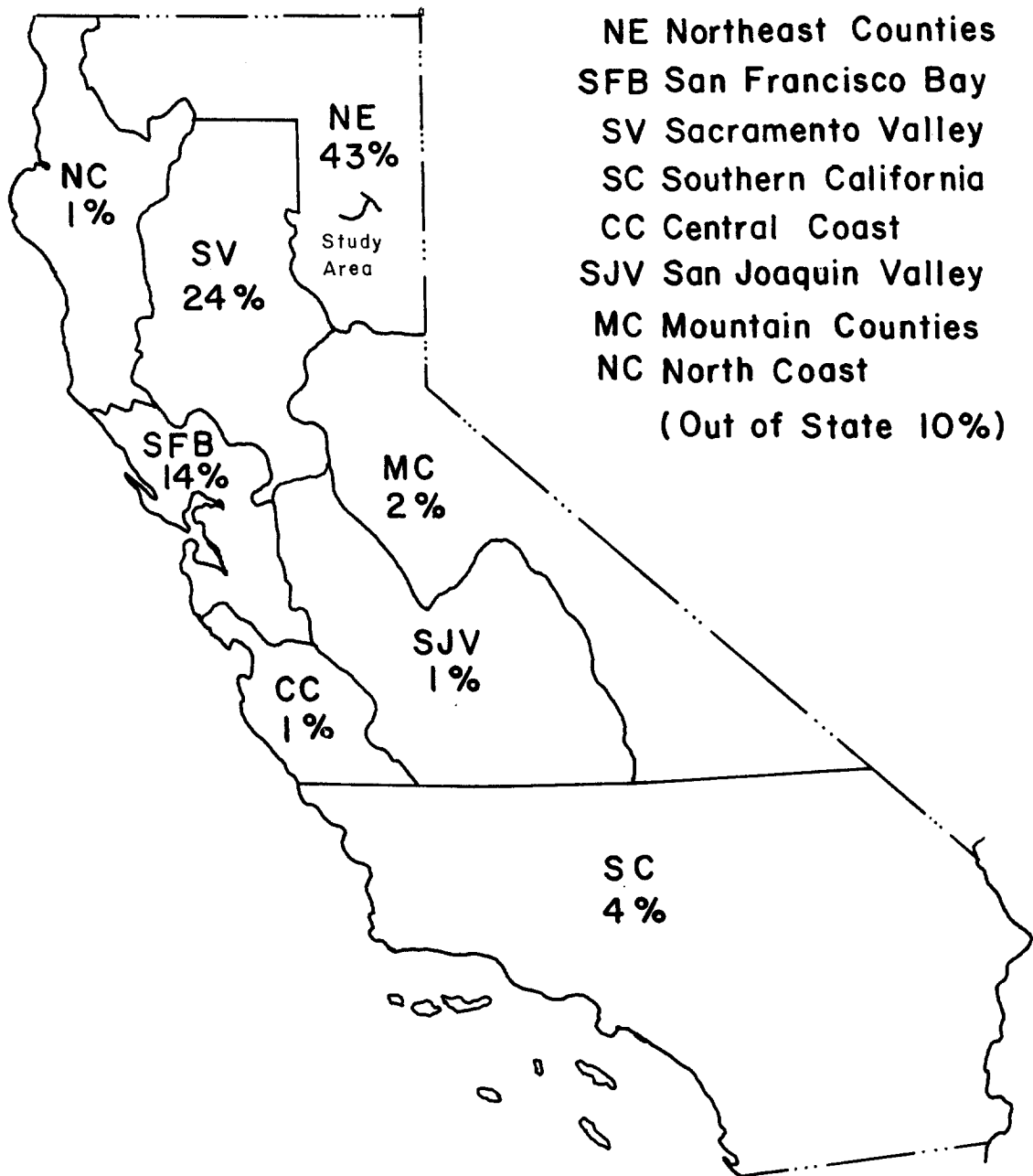


Figure 2
Indian Creek Visitor Origin by County Groups
1979

Sixty percent of the trout were caught in upper Indian Creek, which had 45 percent of the fishing use, and the best fishing with a catch of 0.5 trout per hour. The average success in all areas of the creek was 0.41 trout per angler hour.

The mean length of brown trout caught during 1978 was 23.9 cm (9.4 inches) with a range of 13.0 to 46.5 cm (5.1 to 18.3 inches) (Appendix VI). The mean length of rainbow trout was 23.1 cm (9.1 inches) with a range of 13 to 38 cm (5.1 to 14.9 inches) (Appendix VII). An estimated 210 kg (462 pounds) of brown trout and 230 kg (506 pounds) of rainbow trout were caught. In addition, about 1,500 crayfish were caught in lower Indian Creek in 250 hours of fishing for crayfish.

Indian Creek angler origin was similar to the origin of general recreationists determined from other interviews; 41 percent of the fishermen came from northeastern counties (Figure 3).

Streamflow, Water Quality, and Weather Data

Antelope Lake spilled only briefly in 1979. The lake filled and overflow began on May 25. Spill increased to 0.28 m³/s (10 cfs) on May 25, 26, and 27 and then decreased to zero by June 10. Releases from the dam were maintained at 0.28 m³/s (10 cfs) the remainder of the study period except for 5 days in mid-September when the release was reduced to 0.14 m³/s (5 cfs) to permit fish population sampling (Appendix VIII).

Water quality varied by stream area and time. During the survey season, daily stream temperatures ranged from 2 to 18° C (36 to 65° F) in upper Indian Creek and 6 to 26° C (43 to 78° F) in lower Indian Creek. Temperatures in the Genesee Valley, at Taylorsville Park, and in Indian Valley varied between those listed above. Turbidity in the creek was relatively low during the survey. The highest recorded turbidity was 9 ppm at the mouth in April and the lowest recorded turbidity was less than 1 ppm at Taylorsville County Park in November. The pH index ranged from 6.7 to 8.6 and generally indicated slightly alkaline water. Detailed water quality data are available from the Northern District, Department of Water Resources.

The weather during the survey was generally moderate. Daily air temperatures ranged from a low of -3° C (26° F) in April to a high of 35° C (95° F) in August. Snow fell on one day in May; there were five days of rain and several overcast days during the survey. Wind was common during the afternoons.

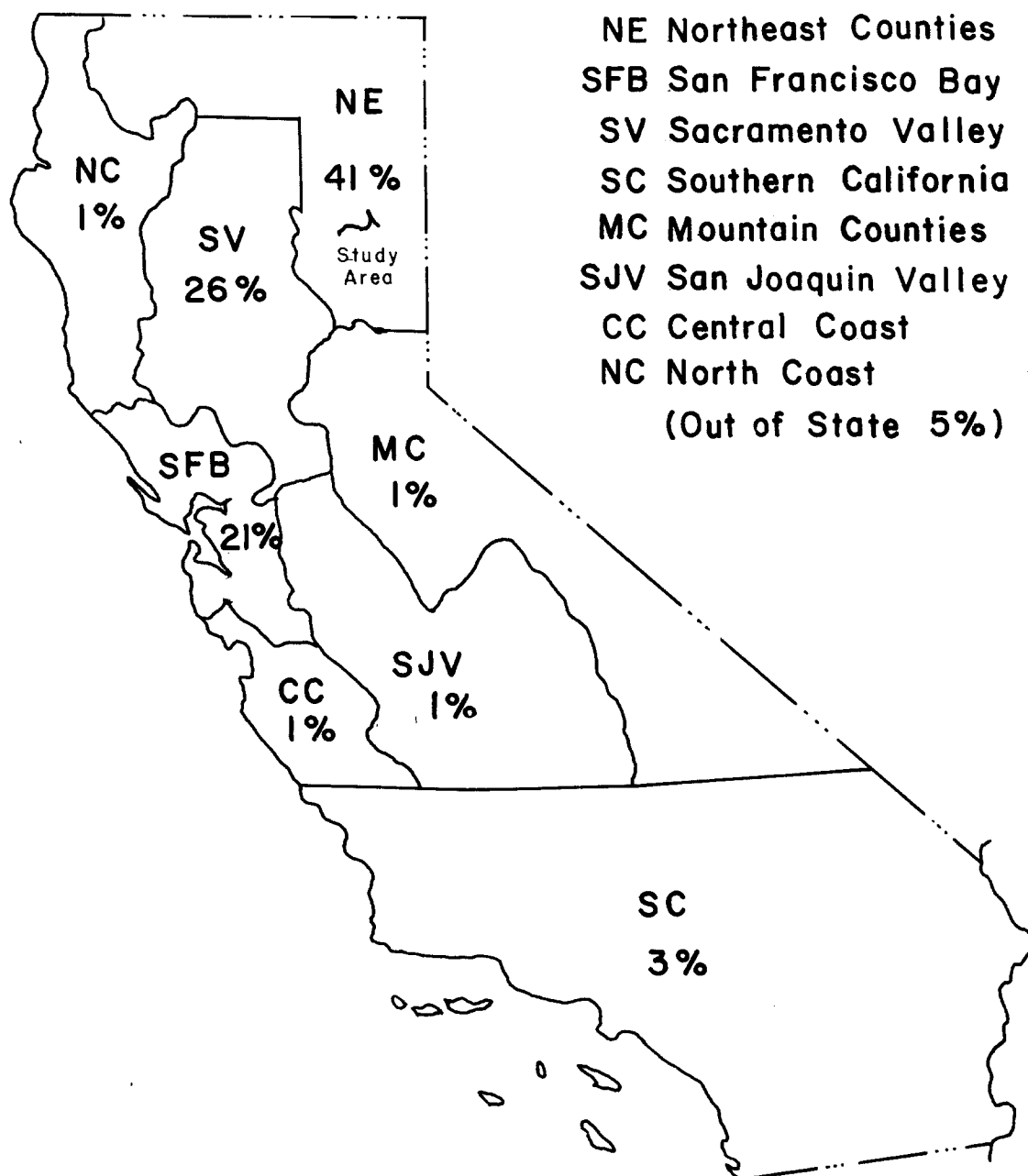


Figure 3
 Indian Creek Angler Origin by County Groups
 1979

DISCUSSION

Understanding the limitations of the recreation use survey and interviews helps put the data obtained in perspective. This section describes constraints and compares results obtained from use counts, interviews, and the creel census. Together, the counts and interviews provide a good picture of total use and activities. The creel census data show angler success.

Limitations of Use Counts

Most recreationists on the creeks were readily observed during use counts, but accurate counts were difficult in certain areas of poor visibility. Each survey reach except Taylorsville Park had a few such areas. The use counts did not accurately reflect certain activities such as sightseeing and hiking. These activities are better estimated by interviews.

The total recreation use estimate of 62,000 recreation hours is more accurate than the estimates for each individual activity. The confidence interval indicates only the probable accuracy of expanding 33 days of counts to estimate use for the 202-day study period.

Vehicle access points were checked on each count, but people with some vehicles were not found. From counts of unassociated vehicles, it appears the estimate of total recreation use may be as much as 25 percent low.

On July 4, during the rodeo at Taylorsville, 1,079 people were present in the rodeo grounds and 344 people were counted in the county park area. Those at the rodeo were not included in the recreation hour estimates, since it was a special event unrelated to the creek and not representative of the stratum. However, most visitors in the vicinity were there primarily for the rodeo, and some rodeo spectators and participants probably showed up in counts elsewhere along the creek that day.

Limitations of Interviews

Interview coverage was good. Approximately 15 percent of the estimated number of recreationists on the creeks was interviewed. Coverage varied considerably on specific dates from roughly 2 to 79 percent. The coverage by stratum varied from 8 to 26 percent.

Despite attempts to contact recreationists randomly, several sources of bias are possible. Bias may be introduced by conscious or unconscious selection of visitors in certain recreation activities or having certain characteristics of age, race, or sex. Another source of bias is failure to cover all access points, such as private lands and residences along the creeks. Strict sampling methods were not used to obtain randomness in interviews.

Comparison of Use Counts and Interviews

Comparison of the distribution of use counts and interviews indicates the degree to which each is representative of the underlying population. The distribution of recreationists observed and interviews are reasonably close (Table 4). Extra interviews were made on upper Indian Creek, while long-term campers at Taylorsville Park were not interviewed repeatedly. During peak use periods, it was impossible to interview recreationists at Taylorsville Park in the same proportion as they were interviewed elsewhere.

TABLE 4

DISTRIBUTION OF INTERVIEWS COMPARED
TO DISTRIBUTION OF ESTIMATED USE

| <u>Survey Area</u> | <u>Upper Indian Creek</u> | <u>Genesee Valley</u> | <u>Taylors- ville Park</u> | <u>Indian Valley</u> | <u>Lower Indian Creek</u> | <u>Total</u> |
|--|-----------------------------------|---------------------------|------------------------------------|--------------------------|-----------------------------------|--------------|
| Percent of interviews | 35 | 12 | 14 | 3 | 36 | 100% |
| Percent of recreation use (recreation hours) | 29 | 9 | 36 | 1 | 25 | 100% |

Comparison of activities reported by recreationists with what we saw them doing also indicates a fairly close correlation between the two samples (Table 5).

TABLE 5

COMPARISON OF ACTIVITY COMPOSITION FROM
INTERVIEWS AND USE COUNTS

| <u>Activity</u> | <u>Picnick- ing and Relaxing</u> | <u>Swimming and Beach Use</u> | <u>Fishing 1/</u> | <u>Camping</u> | <u>Sight- seeing</u> | <u>Riding 2/</u> | <u>Misc./ Other</u> | <u>Total</u> |
|---|--|---------------------------------------|-----------------------|----------------|--------------------------|----------------------|-------------------------|--------------|
| Percent of interviews-- | 27 | 18 | 20 | 13 | 6 | 3 | 13 | 100% |
| Percent of recreation use (recreation hours)-- | 32 | 14 | 12 | 27 | 2 | 3 | 10 | 100% |

1/ Including fishing for crayfish and bait-gathering

2/ Horse, bike, motorbike

The data indicate that the interviews over-represented swimming and fishing and under-represented camping and riding. The differences are logical, due to the nature of the activities. Swimmers and fishermen tend to be stationary and easy to interview; fishermen were also sought out for creel census purposes. Stationary people are more readily interviewed than people riding motorbikes, bicycles, or horses. Finally, campers staying several days were not interviewed repeatedly.

Limitations of Creel Census

About 20 percent of the fishing use was represented in the creel census. The distribution of anglers censused was quite different than the distribution of estimated angler use (Table 6). Anglers on upper Indian Creek were censused more often than those in other areas because the stream-flow studies have focused on the upper creek. Also, anglers on Lower Indian Creek remained for shorter periods and were more difficult to contact.

TABLE 6

DISTRIBUTION OF ANGLERS CENSUSED
COMPARED TO DISTRIBUTION OF ANGLER USE

| <u>Survey Area</u> | <u>Upper Indian Creek</u> | <u>Genesee Valley</u> | <u>Taylorville Park</u> | <u>Indian Valley</u> | <u>Lower Indian Creek</u> | <u>Total</u> |
|--|-----------------------------------|---------------------------|-----------------------------|--------------------------|-----------------------------------|--------------|
| Percent of angler hours censused | 72 | 6 | 2 | 2 | 18 | 100% |
| Percent of angler hours (from use counts) | 45 | 9 | 4 | 4 | 38 | 100% |

Comparison of 1978 and 1979 Survey Results

Overall, recreation use along Indian Creek in 1979 was essentially the same as in 1978, despite the well-publicized gasoline shortage, although there were variations within recreation activities and stream reaches. Only a few of the differences probably are significant.

The 50-percent reduction in fishing use in upper Indian Creek and Genesee Valley may be due to the lower release from Antelope Dam in 1979. Anglers thought fishing was better at higher flows and the creel census data support this belief. The census indicated somewhat lower fishing success in the upper creek and Genesee Valley this year and comparable success in lower areas of the creek. A more detailed analysis of the census results also supports the theory that angling success may be related to streamflow. Estimated catch of fish was about half of last year's total due to the lower levels of use and success in the upper creek.

Total recreation use in Genesee Valley (especially camping) was less in 1979. This may be due to a prohibition against open fires for several months in the late summer and fall. Total recreation use was higher at Taylorville Park, probably because of the unusually long July 4 holiday period in 1979. The July 4 weekend usually is the period of highest recreation use in this area.

A larger percentage of visitors came to Indian Creek for day use only in 1979 and use was more local in origin. This resulted in a shorter length of stay for both day use and overnight visitors. This change may have reflected the uncertainty about gasoline supplies in the metropolitan areas, especially early in the season.

ACKNOWLEDGEMENTS

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APPENDIX I

DESCRIPTION OF SURVEY REACHES

The six survey areas differ notably in characteristics of water quality, topography, vegetation, facilities available, access, and land ownership. Following is an overview of each section.

Upper Indian Creek

The first 18 km (11 miles) of creek below Antelope Dam is closely followed by a paved road with wide pullouts for convenient creek access. The creek flows through a granite canyon timbered with pine and fir. Parts of the canyon floor are meadowlike, especially at the upper ends of the reach. Elevation ranges from 1 500 m (4,900 feet) at the dam to 1 100 m (3,700 feet) at Flourney Bridge. All but the lower 1.6 km (1 mile) of stream is within Plumas National Forest. Water releases were controlled at about $0.28 \text{ m}^3/\text{s}$ (10 cfs) during the 1979 survey. The stream remains cold in summer due to deep-water outflow from the dam and is usually slightly turbid. Abundant brown trout and a few rainbow trout comprise the fishery. Some rainbow trout enter the creek from Antelope Lake when it spills. Sacramento squawfish and brown bullhead also occur in the lowermost portion, where the creek enters Genesee Valley.

Indian Creek in Genesee Valley

The creek gradient is slight in the long valley from Flourney Bridge to Taylorsville Park. Above Little Grizzly Creek, Indian Creek flows through private ranchlands closed to trespass. Below there, the creek flows through short sections of National Forest and private ownerships. Black oak, ponderosa pine, and Douglas fir predominate. The paved county road occasionally comes within sight of the creek. There are no developed recreation facilities in this reach. Important public access points are at Flourney Bridge and a large wooded flat approximately midway in the 18-km (11-mile) reach. A dirt road leads across the flat to the creek at secluded points. The stream is characteristically clear and cool. Summer low flows average $0.8 \text{ m}^3/\text{s}$ (30 cfs) at Flourney Bridge and $1.1 \text{ m}^3/\text{s}$ (40 cfs)

above Taylorsville. This reach has good fishing at times for rainbow trout, Sacramento squawfish, Sacramento sucker (Catostomus occidentalis), and a few brown trout.

Taylorsville Park and Campground Area

The picnic, camping, and rodeo facilities maintained by Plumas County just outside Taylorsville are the only developed recreation facilities on the creek. Indian Creek is easily accessible in the 0.4-km (0.25-mile) section adjacent to the picnic area. The campground and rodeo arena are on the other corners of a three-way intersection. Tall ponderosa pine shade the picnic area; oak, pine, and Douglas fir shelter the campground. There are seven picnic sites plus a group barbecue area, restrooms, horseshoe pits, piped water in the picnic area, and eight campsites in the campground. Rainbow trout are occasionally caught in this reach; other species common to Indian Valley are probably also present. Mill Race Ditch, the major water diversion for Indian Valley, normally removes up to $1.2 \text{ m}^3/\text{s}$ (43 cfs) from the creek about 1.6 km (1 mile) above Taylorsville. However, releases from storage at Antelope Lake remain in the creek.

Indian Creek in Indian Valley

In broad, level Indian Valley the creek flows through fenced pastures and meadows in private ownership. Most of the stream is far from any roads, but three secondary road bridges cross it. Difficult access is available at the bridges and from the road near the mouth of Lights Creek. Significant amounts of water are diverted for irrigation, some being returned to the creek before it leaves the valley. About a fourth of the 14 km (9 miles) of creek in Indian Valley have been channelized. This reach has Sacramento squawfish, Sacramento sucker, carp (Cyprinus carpio), rainbow trout, and brown trout, but fishing is generally poor.

Lower Indian Creek

The lower 11 km (7 miles) of Indian Creek drop in elevation from 1 100 m (3,500 feet) at Arlington Bridge to 900 m (3,000 feet) at the mouth. The rugged canyon is scenic and well wooded with oaks, pine, and Douglas fir. State Highway 89 follows the right bank of the creek; Western Pacific

Railroad crosses the creek about 1.6 km (1 mile) below Arlington Bridge, and is high above the left bank at the mouth. Recreation access is available from pullouts and short spur roads off the highway at many points, but several sections of the creek are hidden from view. There are no developed recreation facilities. The varied stream channel offers small beaches, pools, rock outcroppings, and rapids. The water is normally somewhat turbid and foamy, which detracts from its aesthetic appeal. It becomes quite warm in summer. Average low flows below Crescent Mills are about $0.8 \text{ m}^3/\text{s}$ (30 cfs). The fishery is made up primarily of rainbow and brown trout, with some Sacramento squawfish, Sacramento sucker, carp, brown bullhead, and bluegill. Crayfish are abundant in summer. Fishing is fair in spring and fall.

APPENDIX II

1979 INDIAN CREEK RECREATION USE COUNT SCHEDULE

| Date | Daylight Hours | Use Counts | | Creel Census Time (approx.) |
|-------------------|-------------------|------------|-----------|--------------------------------|
| | | Count | Time | |
| April 28 PST | 15½ | 1st | 0630-0730 | 0800-1200 |
| | | 2nd | 0900-1000 | 1400-1800 |
| | | 3rd | 1200-1300 | |
| | | 4th | 1430-1530 | |
| | | 5th | 1730-1830 | |
| April 29 DST | 15½ | 1st | 0730-0830 | 0800-1200 |
| | | 2nd | 1000-1100 | 1500-1900 |
| | | 3rd | 1300-1400 | |
| | | 4th | 1530-1630 | |
| | | 5th | 1830-1930 | |
| May-August DST | 16½ | 1st | 0700-0800 | 0900-1300 |
| | | 2nd | 1000-1100 | 1600-2000 |
| | | 3rd | 1300-1400 | |
| | | 4th | 1600-1700 | |
| | | 5th | 1900-2000 | |
| September DST | 14 | 1st | 0730-0830 | 0900-1300 |
| | | 2nd | 1000-1100 | 1400-1800 |
| | | 3rd | 1230-1330 | |
| | | 4th | 1500-1600 | |
| | | 5th | 1730-1830 | |
| October DST | 13 | 1st | 0800-0900 | 0900-1300 |
| | | 2nd | 1000-1100 | 1400-1800 |
| | | 3rd | 1230-1330 | |
| | | 4th | 1500-1600 | |
| | | 5th | 1700-1800 | |
| November PST | 12 | 1st | 0730-0830 | 0800-1200 |
| | | 2nd | 0930-1030 | 1300-1700 |
| | | 3rd | 1130-1230 | |
| | | 4th | 1330-1430 | |
| | | 5th | 1530-1630 | |

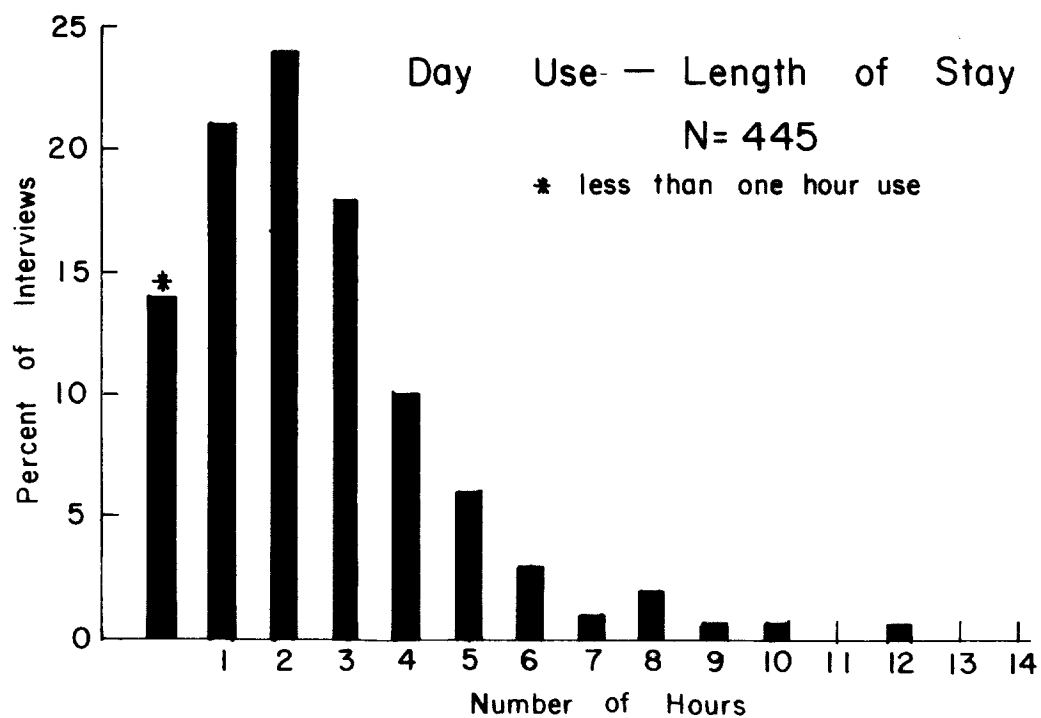
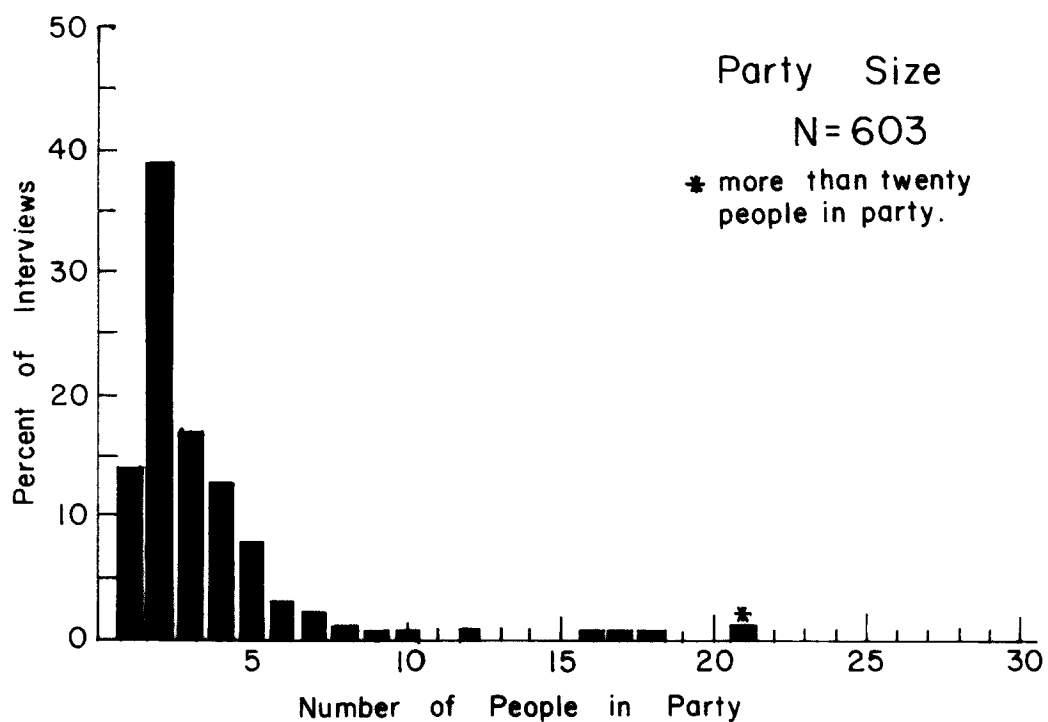
APPENDIX III

| | | | | | | River Use Survey | | California Department of Water Resources | |
|--|--|--|--|--|--|------------------------------|--|--|-----|
| | | | | | | COMMENTS | | ACTIVITY DISTRIBUTION COUNT | |
| | | | | | | SITE CHARACTERISTICS | | INDIAN CREEK (Plumas County) | |
| | | | | | | LOCATION - REACH | | DATE: | --- |
| | | | | | | TIME START | | SHEET NO. | --- |
| | | | | | | TIME FINISH | | MILE PT. | --- |
| | | | | | | AIR TEMP. | | | |
| | | | | | | WEATHER | | | |
| | | | | | | WATER TEMP. | | | |
| | | | | | | FLOW C.F.S. | | | |
| | | | | | | APPEARANCE | | | |
| | | | | | | KAYAKING | | | |
| | | | | | | CANOEING | | | |
| | | | | | | RAFTING | | | |
| | | | | | | SHORE FISHING | | | |
| | | | | | | CRAY FISHING | | | |
| | | | | | | BEACH USE | | | |
| | | | | | | SWIMMING/WADING | | | |
| | | | | | | AQUATIC NATURE STUDY | | | |
| | | | | | | GOLD SEEKING | | | |
| | | | | | | SIGHTSEEING | | | |
| | | | | | | WALKING FOR PLEASURE | | | |
| | | | | | | BICYCLE RIDING | | | |
| | | | | | | MOTORCYCLING/ ORV | | | |
| | | | | | | HORSEBACK RIDING | | | |
| | | | | | | JUST RELAXING | | | |
| | | | | | | CAMPING | | | |
| | | | | | | USING CAMPING facilities | | | |
| | | | | | | USING PICNIC facilities | | | |
| | | | | | | PICNICKING | | | |
| | | | | | | PARTICIPATE IN OUTDOOR GAMES | | | |
| | | | | | | ATTD.EVENT play,sports | | | |
| | | | | | | CHILDREN PLAYING | | | |
| | | | | | | ATTD.INTERP.PROGRAM | | | |
| | | | | | | NATURE STUDY-FLORA | | | |
| | | | | | | BIRDWATCHING | | | |
| | | | | | | PHOTOGRAPHY/PAINTING | | | |
| | | | | | | TOTALS | | | |

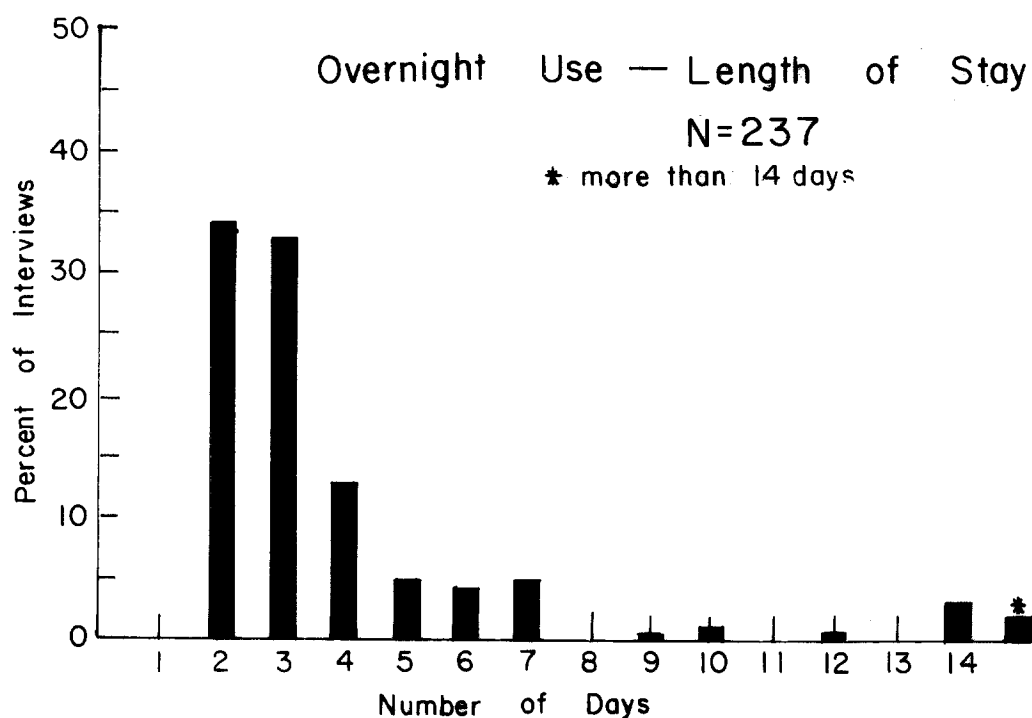
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Revised June 24, 1974

Appendix V Visitor Characteristics — Indian Creek, 1979



Appendix V (continued)



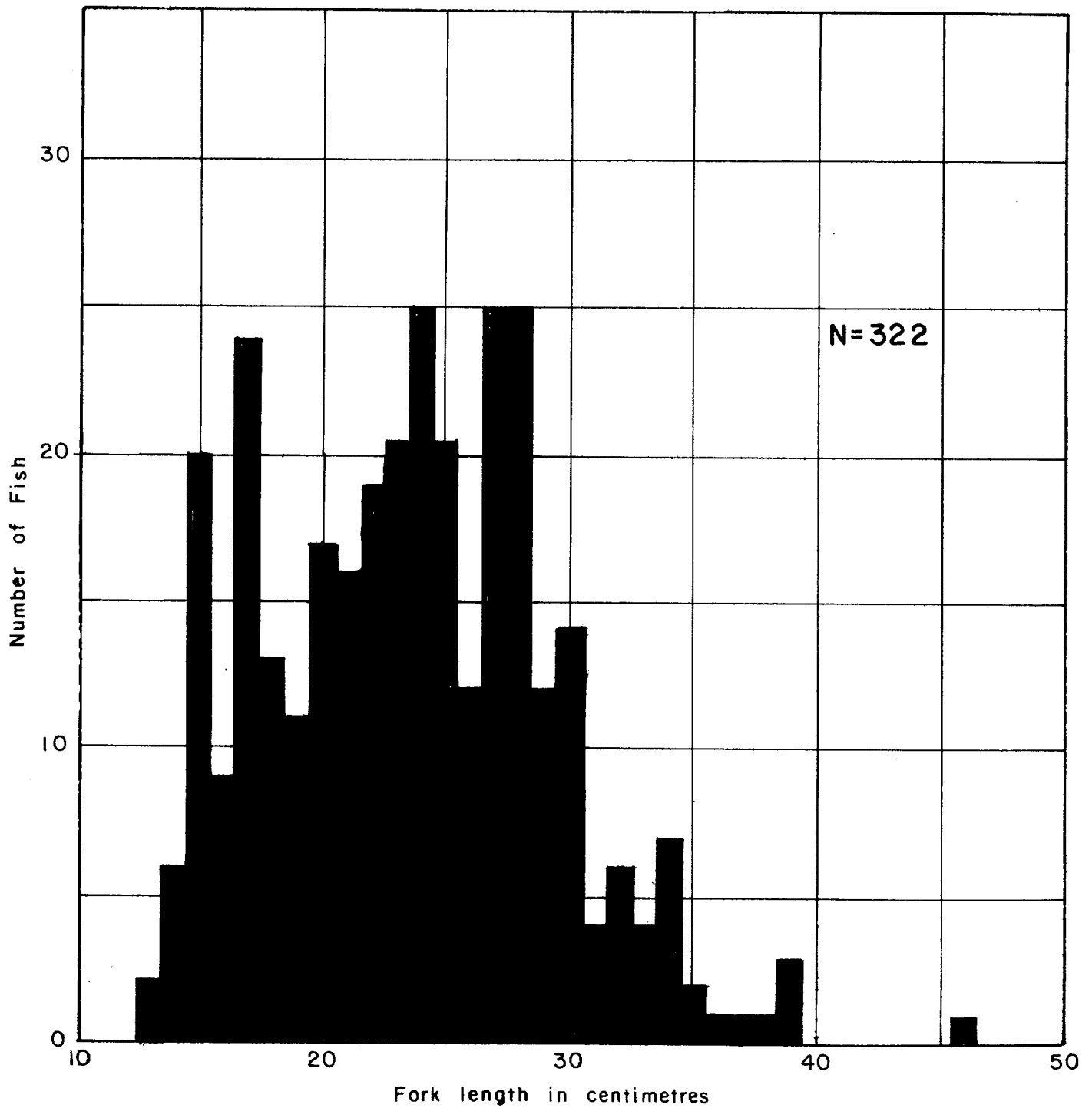
Place of Overnight Accommodation

| <u>Type of Place</u> | <u>Percent of Interviews</u> |
|-------------------------------|------------------------------|
| Undeveloped Area..... | 52 |
| Public Campground / Park..... | 31 |
| Friends or Relatives..... | 10 |
| Cabin or Summer Home..... | 3 |
| Motel / Resort..... | 3 |
| Private Campground..... | 1 |

Camping Accommodation

| <u>Type of Accommodation</u> | <u>Percent of Interviews</u> |
|--------------------------------|------------------------------|
| Travel Trailer..... | 26 |
| Pickup Camper..... | 22 |
| Tent..... | 15 |
| Sleeping Out / Car / Boat..... | 14 |
| Motorhome / Van / Bus..... | 13 |
| Tent Trailer..... | 3 |

Appendix VI
Length Frequency of Censused Brown Trout
Indian Creek, 1979



Appendix VII
Length Frequency of Censused Rainbow Trout
Indian Creek, 1979

